Danya Lette

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Education

- **University of Toronto** Ongoing
  Ph.D. in Computer Science (anticipated graduation 2028)
- **University of Toronto** 2023
  M.Sc. in Computer Science
- **University of Toronto** 2021
  B.Sc. (Hons) in Computer Science
- **University of Toronto** 2013
  B.A. (Hons) in Philosophy

Research Interests

Automated formal verification, probabilistic programming, program synthesis, programming language theory, concurrency.

Awards

— Bell Graduate Scholarship 2022
— Thriver Prize in Computer Science 2021
— NSERC USRA 2020, 2021
— Dean's List 2019, 2020

Leaves of Absence

— Parental Leave (June 2023-September 2024)

Publications

[1] **Danya Lette** and Azadeh Farzan. 2023. Commutativity for concurrent program termination proofs. In *Computer Aided Verification*. Constantin Enea and Akash Lal, editors. Springer Nature Switzerland, Cham, 109–131. ISBN: 978-3-031-37706-8.

[2] Azadeh Farzan, **Danya Lette**, and Victor Nicolet. 2022. Recursion synthesis with unrealizability witnesses. In *Proceedings of the 43rd ACM SIGPLAN International Conference on Programming Language Design and Implementation* (PLDI 2022). Association for Computing Machinery, San Diego, CA, USA, 244–259. ISBN: 9781450392655.

Teaching

- **Teaching Assistant** at University of Toronto 2019-present
  — CSC410: Software Testing and Verification (Fall 2021, Fall 2022)
  — CSC111: Foundations of Computer Science II (Winter 2021)
  — CSC165: Mathematical Expression and Reasoning (Winter 2020)
  — CSC324: Principles of Programming Languages (Fall 2019, Winter 2022)
  — CSC148: Introduction to Computer Science (Winter 2019)

  As a teaching assistant, I have led tutorials, designed assessments, designed and delivered lessons, graded assignments, assisted students one-on-one during office hours, managed student discussion forums, and invigilated exams.

Research

- **Independence for Modular Automated Verification of Probabilistic Programs** 2024-Ongoing
  This work is aimed at exploring the automated inference of independence relationships and the use of independence in learning modular proofs of correctness for probabilistic programs.
- **Commutativity For Concurrent Program Termination Proofs** 2022-2023
  This work explores how using commutativity can improve the efficiency and efficacy of algorithmic termination checking for concurrent programs by exploiting equivalence classes. We incorporate and expand upon classic bounded commutativity in the context of termination. We implemented this work in tool written in Python and C++. This work resulted in a conference paper, presented at CAV 2023.
- **Synthesis of Recursive Programs** Summer 2021
  We developed a bounding method for synthesis of recursive functions over recursive input data types, implemented in a tool called Synduce written in OCAML. This work resulted in a conference paper at PLDI 2022. (Funding: NSERC UGSRP)
- **Symmetry Reduction for Verification of Concurrent Programs** Summer 2020
  I investigated the use of symmetry reductions for efficient automated formal verification of programs exhibiting a high degree of symmetry such as multi-threaded programs by developing formalisms, designing algorithms for symmetry-reduced verification, evaluating these (for efficiency, soundness and completeness), and implementing them in an automated verification tool written in Haskell. (Funding: NSERC UGSRP)

Presentations

- **Research Presentations**
  - Symmetry Reduction for Verification of Concurrent Programs (UGSRP 2020)
- **Other**
  - Scientific Writing (PRISM 2022)

Employment

- **Software Developer** 2013-2017
  - Mercatus (Oct 2015-Nov 2016)
  - Toronto Int'l Film Festival (Dec 2014-Aug 2015)
  - Freelance (2013-2017)

Service

- **Mentorship**
  - Graduate Mentor for the Graduate Application Assistance Program (GAAP) 2024
  - Graduate Mentor for the Preparation for Research through Immersion, Skills, and Mentorship (PRISM) Program 2022, 2025
  - Supervisor for the Undergraduate Student Research Project (USRA): Learning Ranking Functions for Termination Proofs Using Syntax-Guided Synthesis, by Lake Trefler 2022
- **Journals & Conferences**
  - Program Committee Member for Autonomous System Quality Assurance and Prediction with Digital Twins (ASQAP 2025) 2024
  - Advisor (2019-2020), Editor-in-Chief (2018-2019), Editor (2017-2018) at the Review of Undergraduate Computer Science (RUCS) 2017-2020
- **Outreach**
  - Founder and Lead Organizer of the CS Research-a-Thon 2019, 2020
  - Editor and Lead Author of the RUCS Undergraduate Research Guide 2019
  - Lead Organizer of outreach events: Research Village (2020), UGSRP Meet & Greet (2019), Undergraduate Research Info Session (2018) 2018-2020